



Preliminary results from the *ECOCADIZ-RECLUTAS 2020-10* Spanish acoustic survey (02 – 21 October 2020)

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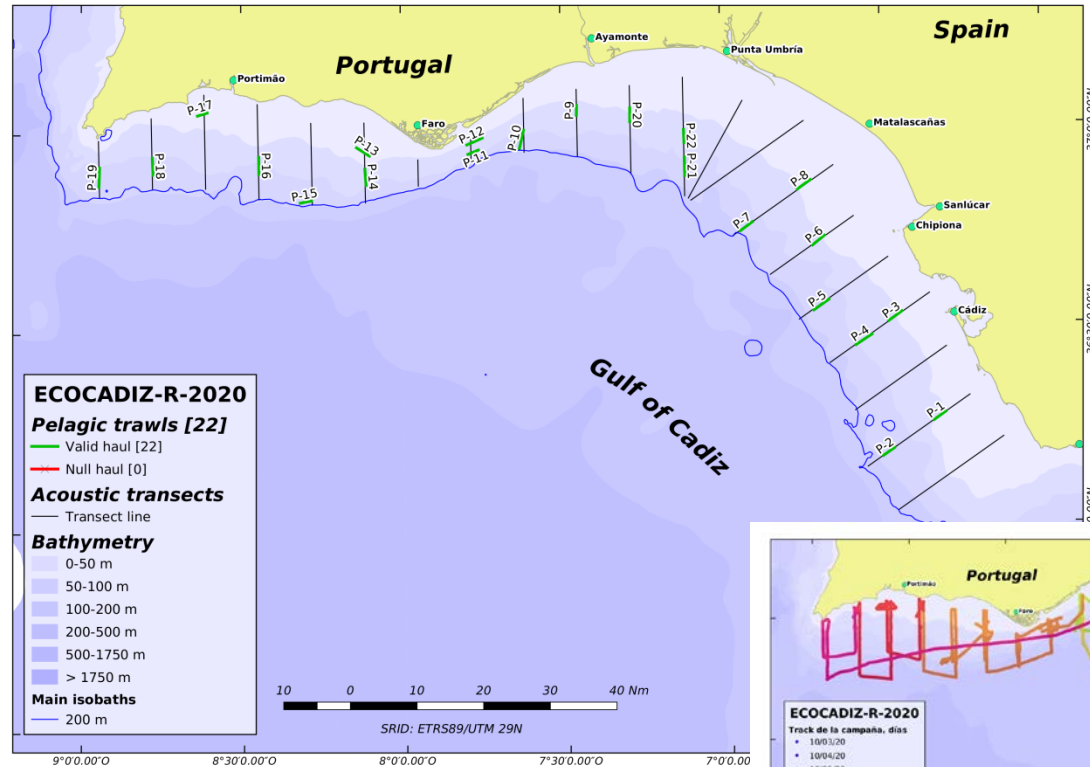
ECOCADIZ-RECLUTAS 2020-10 survey: Main objectives

- Acoustic assessment (by echo-integration) and mapping of neritic fish resources and of the oceanographic and biological conditions off the Gulf of Cadiz continental shelf, with special reference to anchovy and sardine juveniles (age 0).
- Biological characterization of assessed fish species. **Restricted to anchovy, sardine and chub mackerel only due to shortage of personnel onboard (COVID-19 protocols, etc.).**
- Mapping of anchovy and sardine recruitment areas in the surveyed area.
- Mapping of the distribution of the abundance and biomass of marine litter.
- Hydrological characterization of the surveyed area (CTD/LADCP/VMADCP & TSG-F).

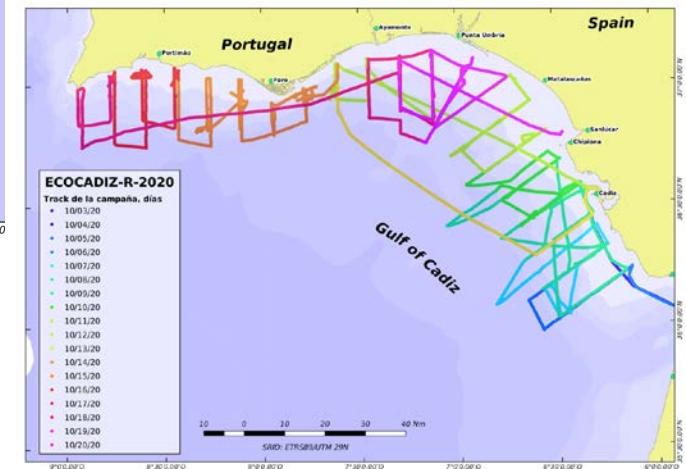
ECOCADIZ-RECLUTAS 2020-10: Methods and samplers

Variable	ECOCADIZ-RECLUTAS 2020-10
Dates	02 – 21/10/2020
Research vessel	<i>Ramón Margalef</i> (IEO)
Survey design	21 transects, normal to the shoreline, 8-nm interspaced, 20 – 200 m depth
Acoustic sampling	21 transects
Echosounder (working freq.)	EK 80 (18, 38, 120, 200, 333 kHz)
Fishing gear (mean vert. op.)	<i>Gloria HOD 352</i> (10 m)
Fishing gear performance monitoring	Net Sonar (FS 20) + Scanmar door sensors
Valid fishing hauls (total)	22 (22)
CUFES (# st.)	No
VMADCP/TSG-F /AANDERAA	Yes/No/Yes
CTD-LADCP (# casts)	Yes (178, over 23 transects)
Manta Trawl (# st.)	No
Top Predator census	No

ECOCADIZ-RECLUTAS 2020-10: Methods (acoustics and fishing hauls)

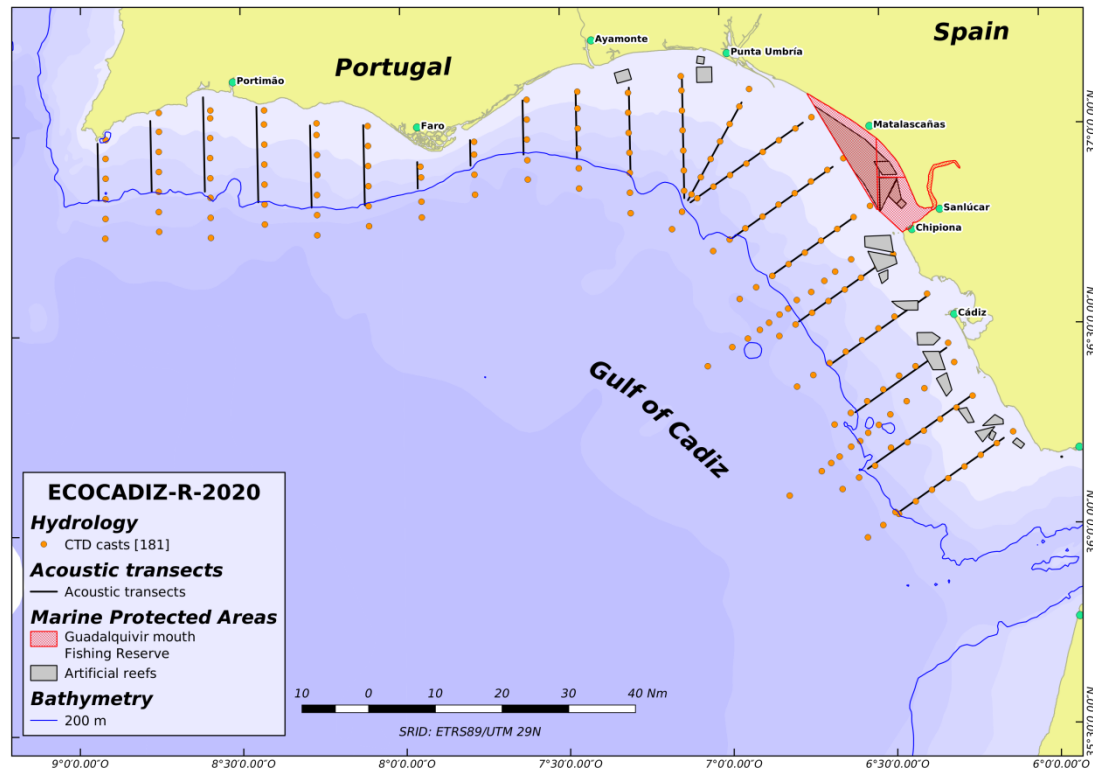


- ACOUSTICS: 21 transects.
- Several “Jumps” looking for “space-time opportunity windows” for the acoustic surveying trying to avoid Spanish Army & Navy exercises all over the Spanish waters.



- GROUNDTRUTHING PELAGIC HAULS: 22 hauls, 22 valid ones.

ECOCADIZ-RECLUTAS 2020-10 : Methods (CTD+LADCP)

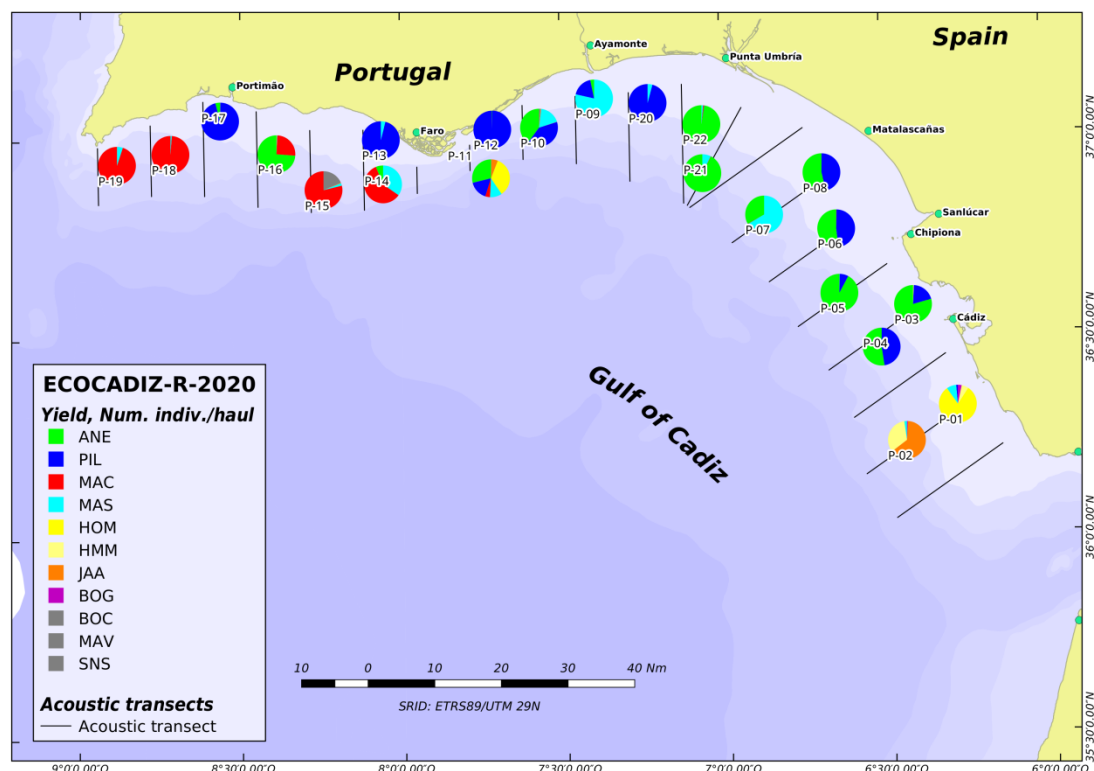


- CTD-LADCP: 179 stations in 23 transects (+ 2 stations for calibration and self-noise exercises).
- VMADCP (in night tracks).
- No TSG-F.
- AANDERAA (24 h).

ECOCADIZ-RECLUTAS 2020-10 survey: Available estimates

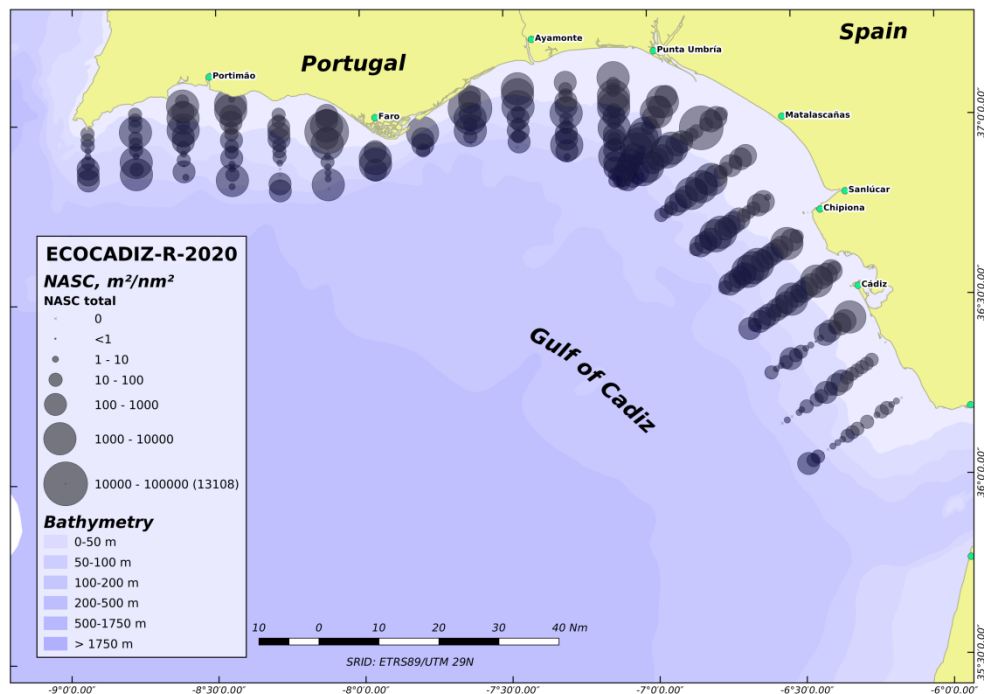
- Estimates available the last week(end).
- Only size-based N & B estimates for anchovy, sardine and chub-mackerel.
- NACs distribution maps for the remaining species.

ECOCADIZ-RECLUTAS 2020-10: fishing stations and their species composition



- 22 valid fishing hauls: 19 866 kg, 458 thousand fish of captured species.
- MAS the most frequent. ANE, MAC & PIL very frequent. BOG, HOM, HMM & JAA less frequent. BOC, SNS, MAV rare.
- PIL & MAS: high yields; ANE, MAC & HOM: medium yields; rest: low or very low yields.

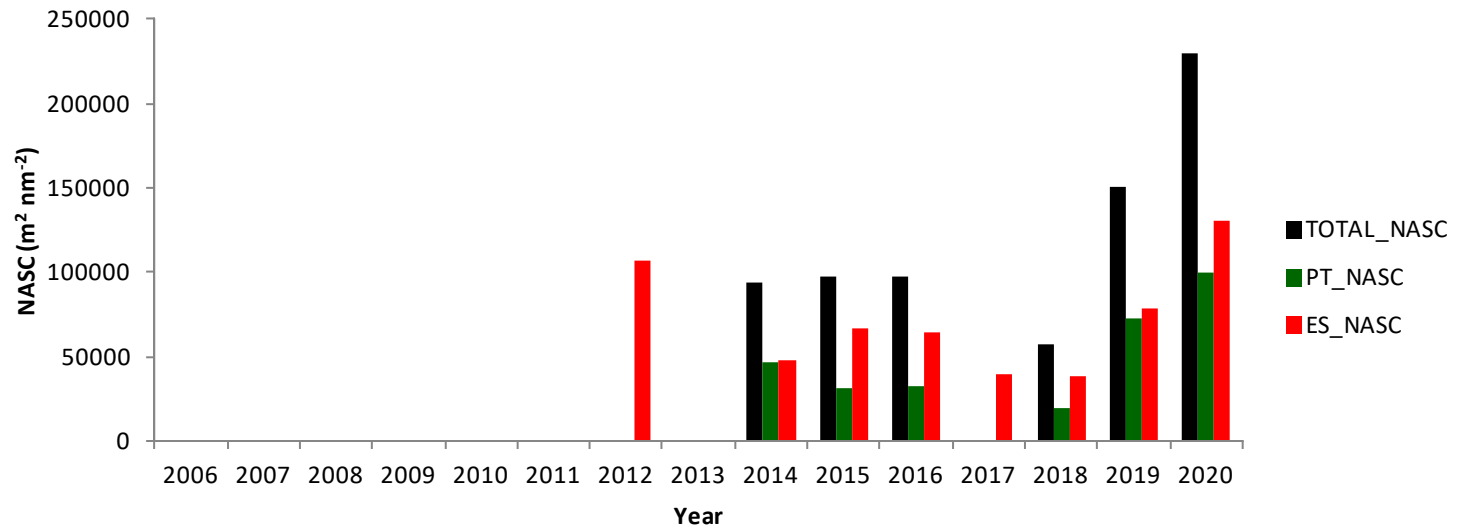
ECOCADIZ-RECLUTAS 2020-10: "pelagic fish species assemblage"



- Assessed ESDUs: Total = 310. Portugal = 107; Spain = 203.
- S_A (m² nmi⁻²): Total = 229 241. Portugal = 99 332 (43.3%); Spain = 129 909 (56.7%).

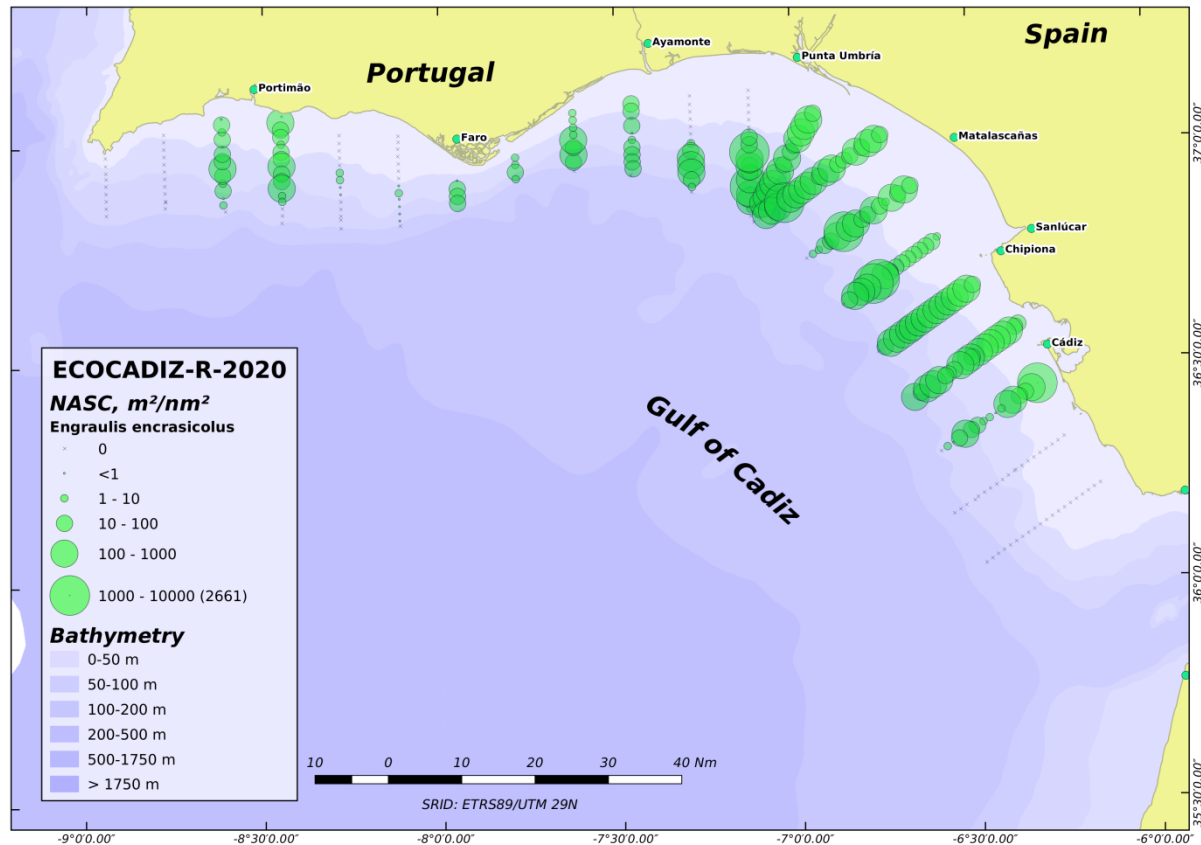
S_A (m ² nmi ⁻²)	Total spp.	Sardine	Anchovy	Mackerel	Chub mack.	Horse-mack.	Medit. h-mack.	Blue jack-mack.	Bogue	Boarfish	Longspine snipefish	Pearlside
Total Area (%)	229241 (100.0)	131553 (57.4)	45404 (19.8)	7453 (3.3)	32558 (14.2)	2395 (1.0)	1673 (0.7)	281 (0.1)	146 (0.1)	0.2 (0.0001)	4 (0.002)	7774 (3.4)
Portugal (%)	99332 (43.3)	57999 (44.1)	2832 (6.2)	7428 (99.7)	22115 (67.9)	1419 (59.2)	0 (0.0)	240 (85.5)	50 (34.5)	0.2 (100.0)	4 (100.0)	7245 (93.2)
Spain (%)	129909 (56.7)	73555 (55.9)	42572 (93.8)	25 (0.3)	10443 (32.1)	976 (40.8)	1673 (100.0)	41 (14.5)	95 (65.5)	0 (0.0)	0 (0.0)	529 (6.8)

ECOCADIZ-RECLUTAS 2020-10: "pelagic fish species assemblage"



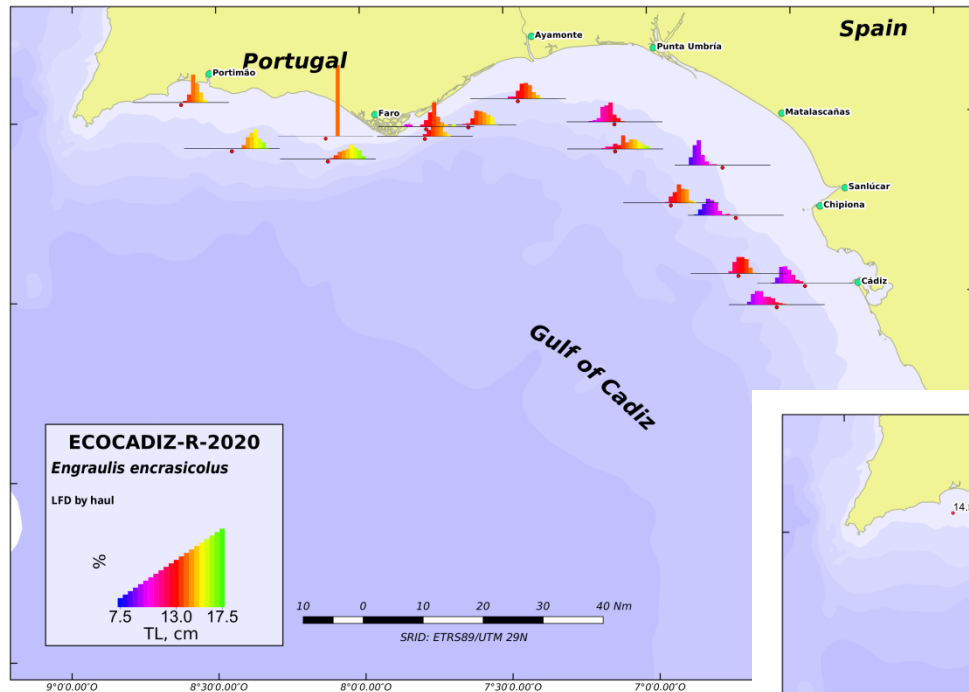
- S_A (m² nmi⁻²): historical maxima for total and regional NASC.
- Possible causes:
 - High total PIL_NASC (Spanish & Portuguese waters).
 - High total ANE_NASC (Spanish waters) and MAS_NASC (Portuguese waters).

ECOCADIZ-RECLUTAS 2020-10: Anchovy. NASC.

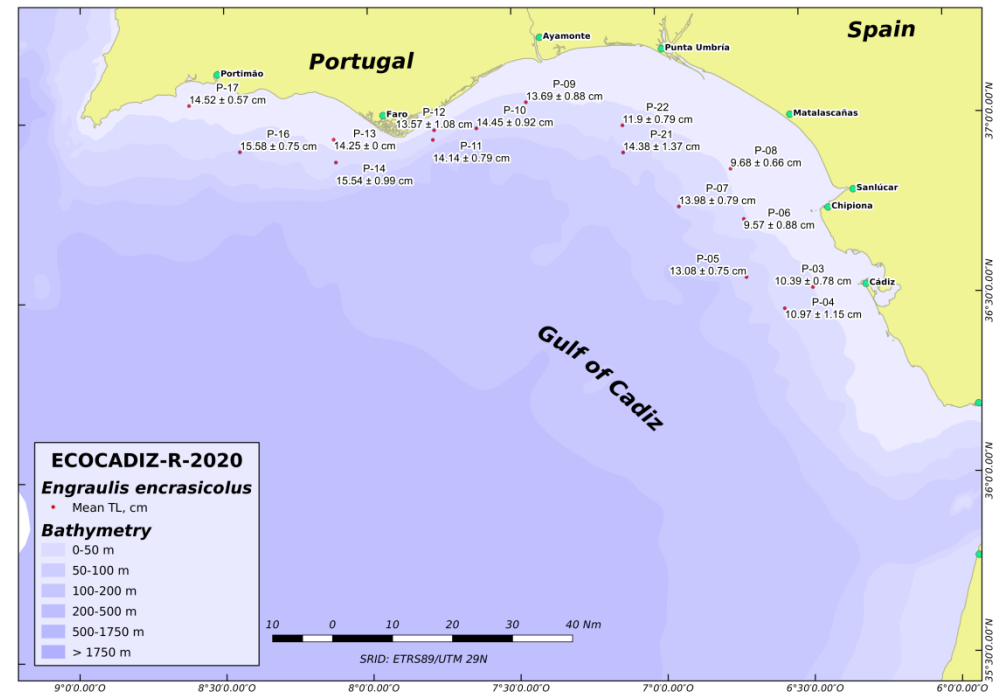


- Widely distributed, but concentrated between Eastern Cape Santa Maria and Bay of Cadiz.

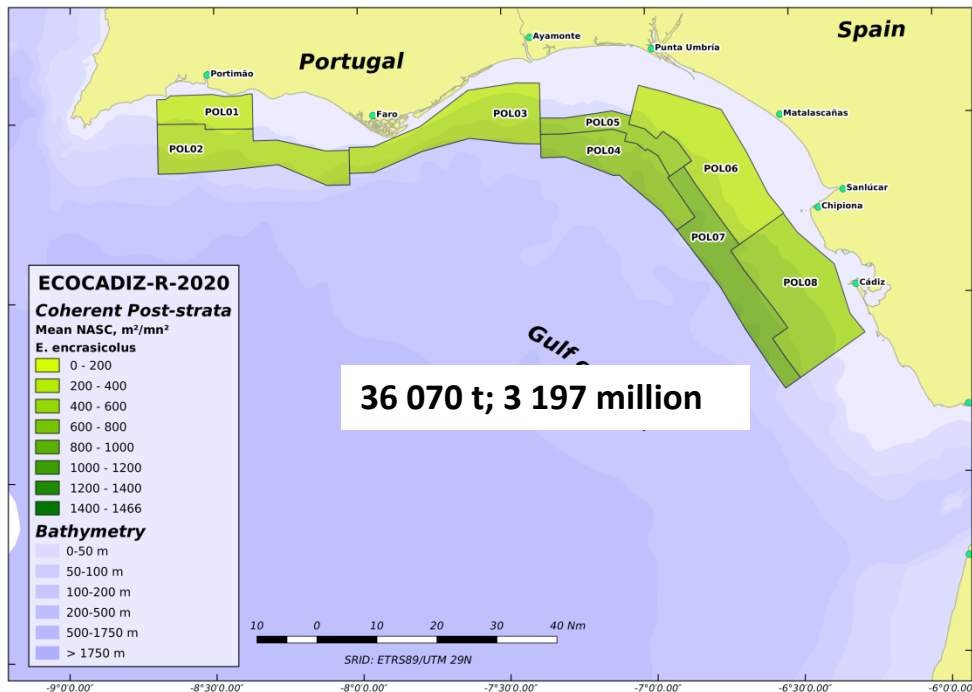
ECOCADIZ-RECLUTAS 2020-10: Anchovy. LFD and mean size in fishing hauls.



- The largest fish in western Algarve.
- The smallest fish in coastal waters between Cadiz Bay and Matalascañas.



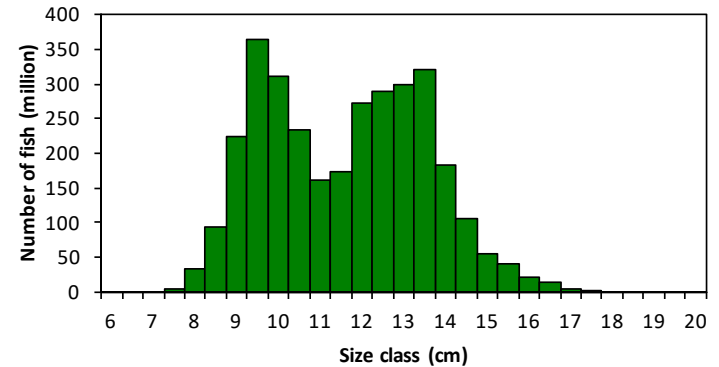
ECOCADIZ-RECLUTAS 2020-10: Anchovy. Acoustic estimates.



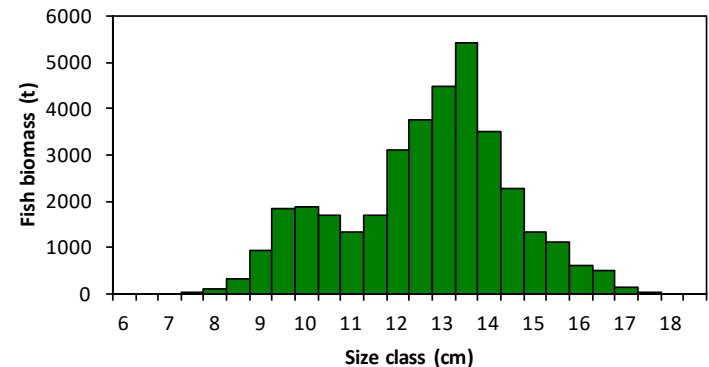
A total of **36 070 t** and **3 197 million** fish were estimated for this species for the whole surveyed area. (PT: 3 290 t; 145 million. ES: 32 780 t; 3 051 million).

(ECOCADIZ-RECLUTAS 2019-10: 48 398 t; 5 518 million).

9a S (TOTAL ABUNDANCE)

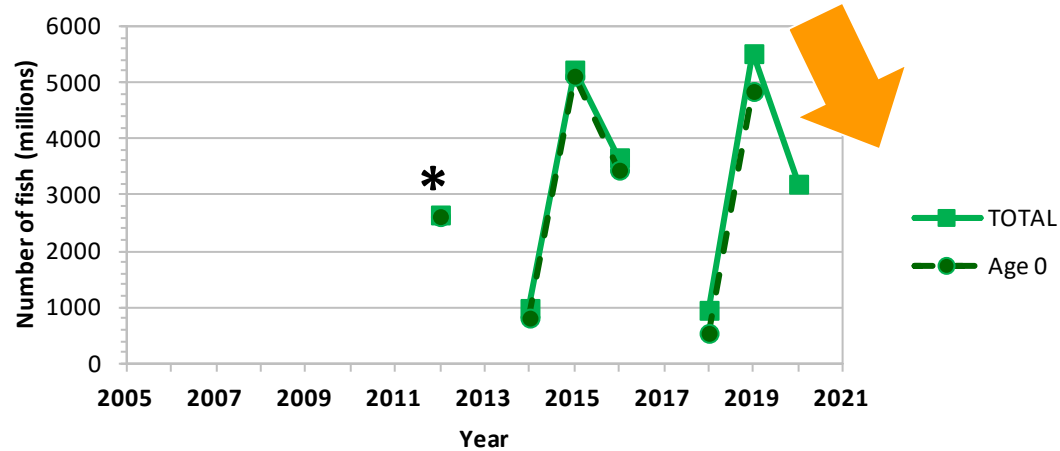


9a S (TOTAL BIOMASS)

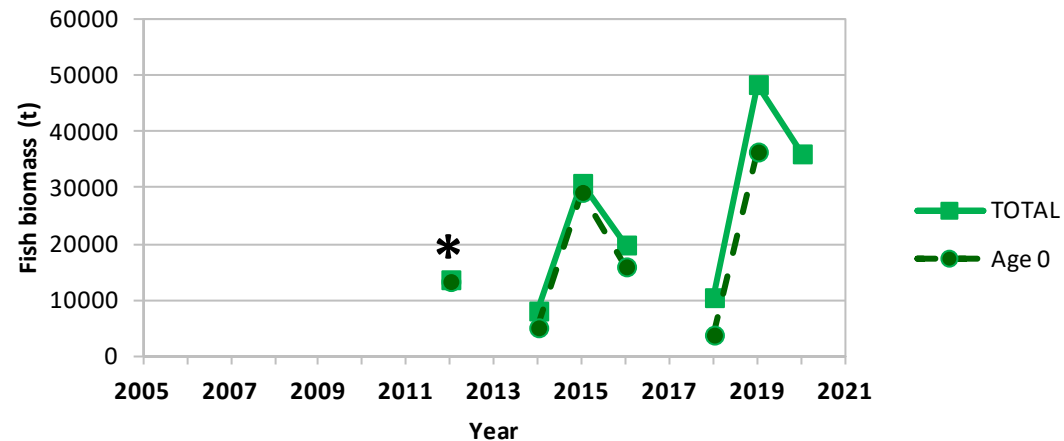


ECOCADIZ-RECLUTAS 2020-10: Anchovy. Trends.

Anchovy abundance
ECOCADIZ-RECLUTAS Surveys

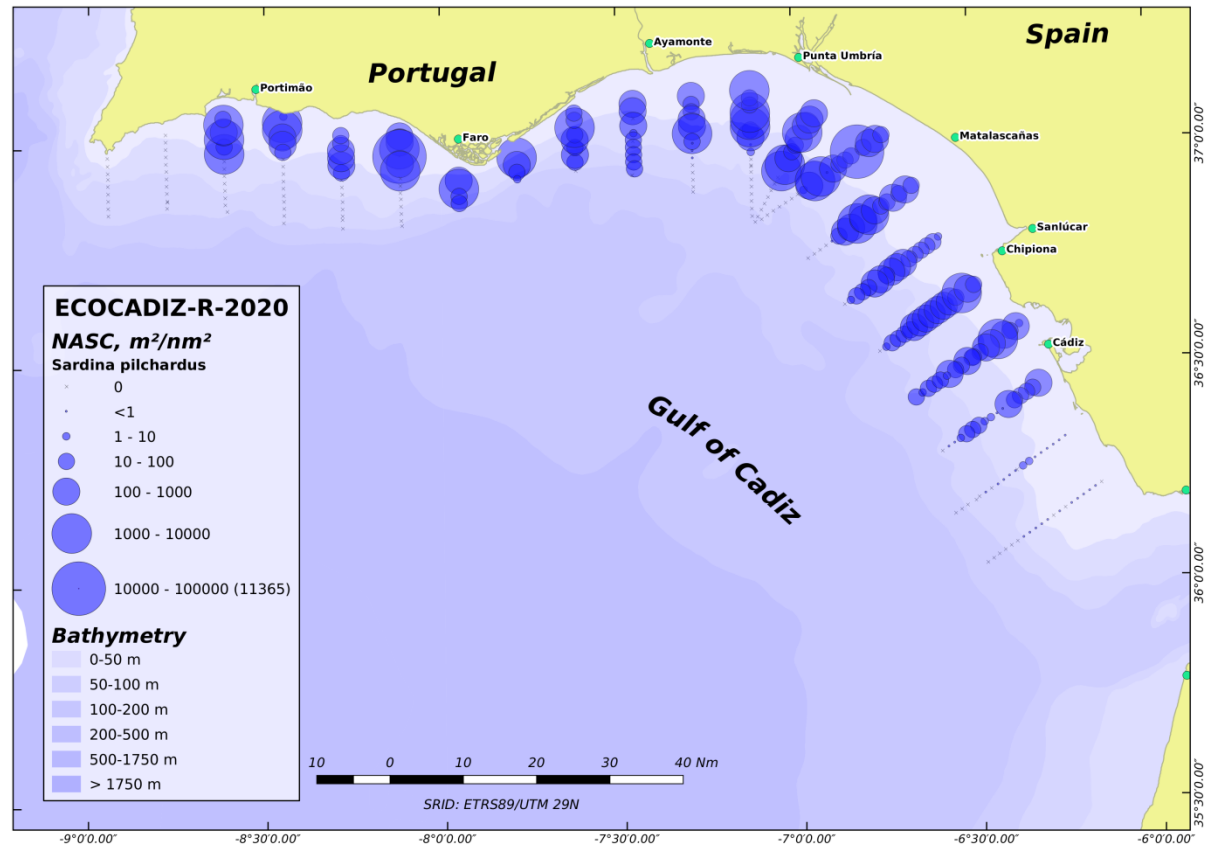


Anchovy biomass
ECOCADIZ-RECLUTAS Surveys



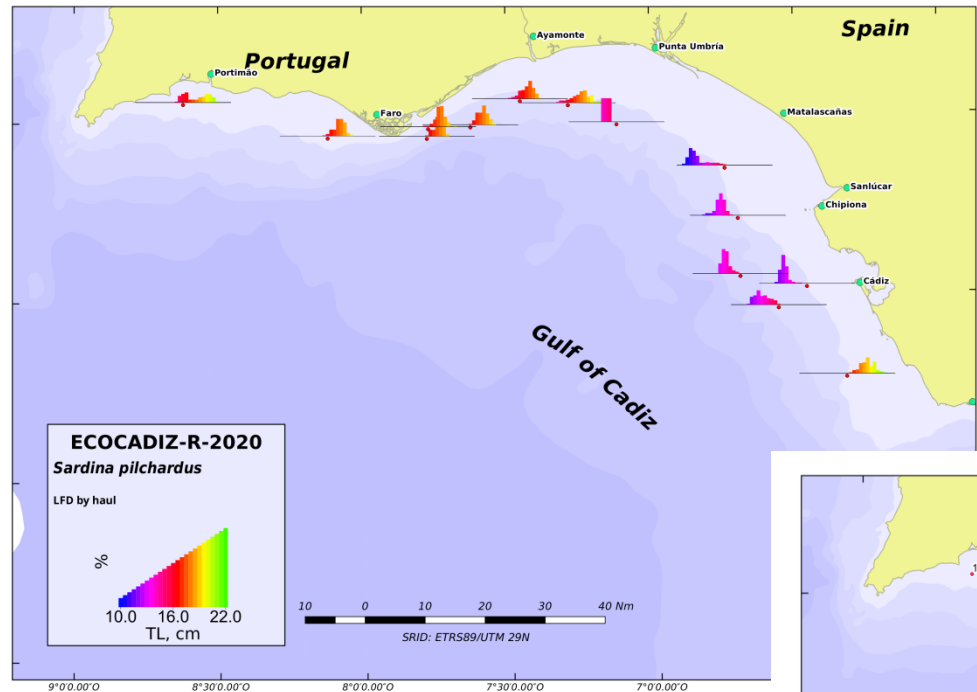
(*) Spanish waters only

ECOCADIZ-RECLUTAS 2020-10: Sardine. NASC.

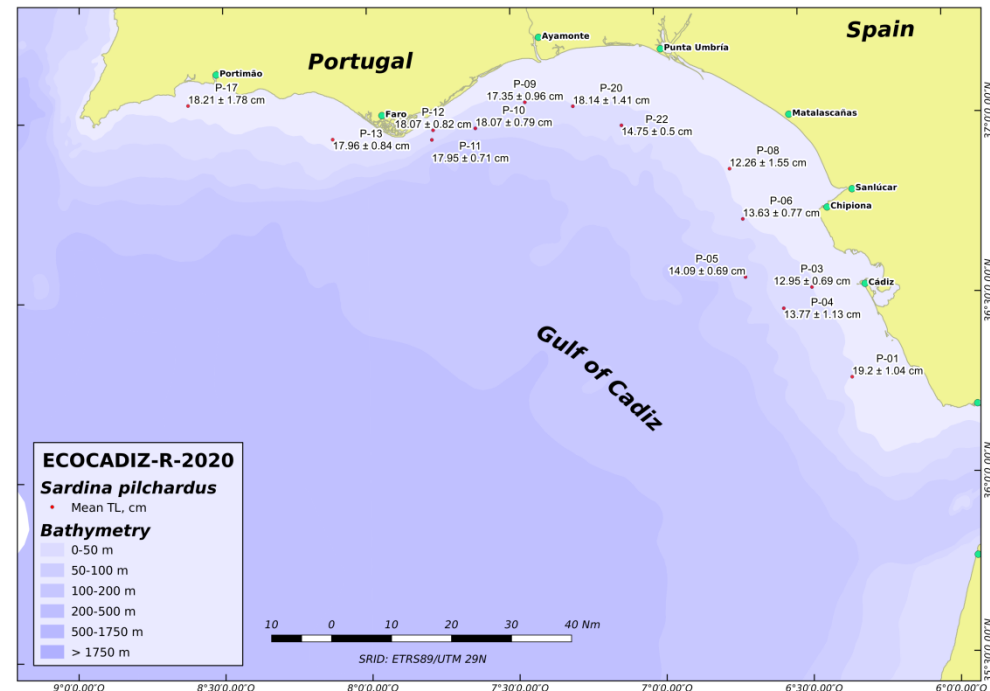


- Widely distributed (avoiding both western- and easternmost waters), with very high densities in the inner-middle shelf waters.

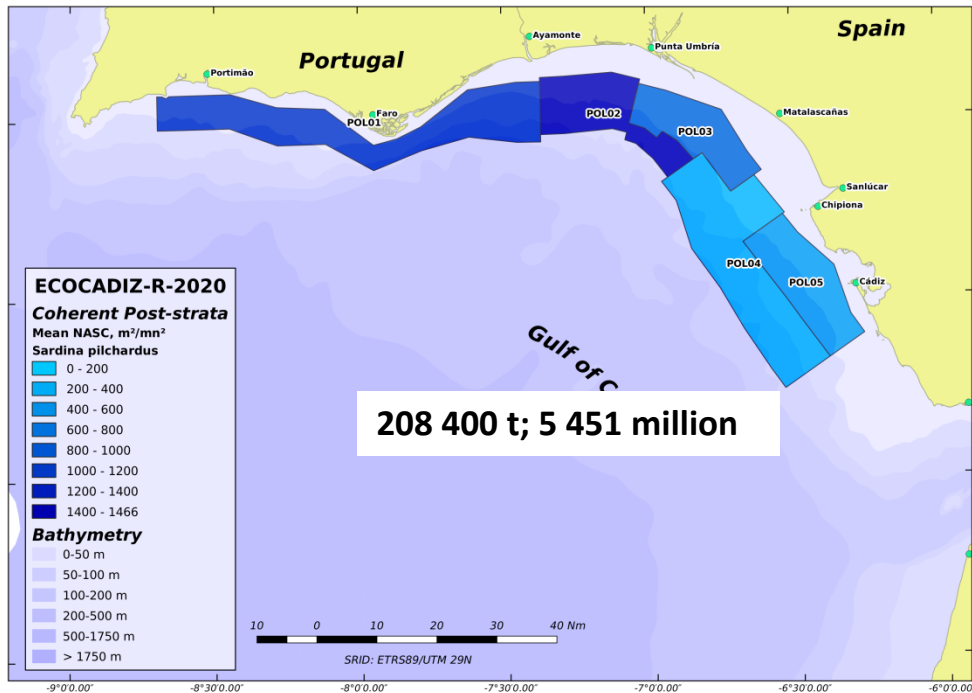
ECOCADIZ-RECLUTAS 2020-10: Sardine. LFD and mean size in fishing hauls.



- The largest fish mainly in Portuguese waters and secondarily in the easternmost Spanish waters.
- The smallest fish in coastal waters between Cadiz Bay and Matalascañas.



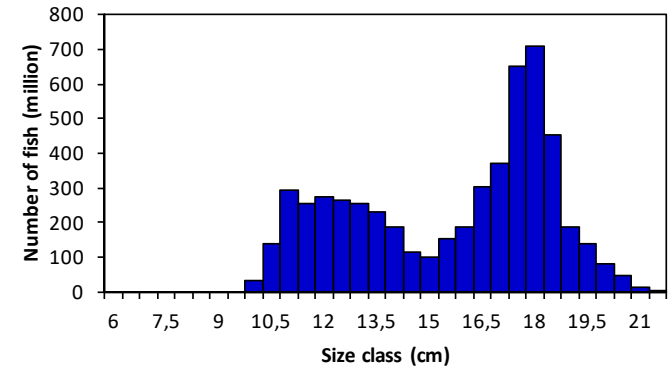
ECOCADIZ-RECLUTAS 2020-10: Sardine. Acoustic estimates.



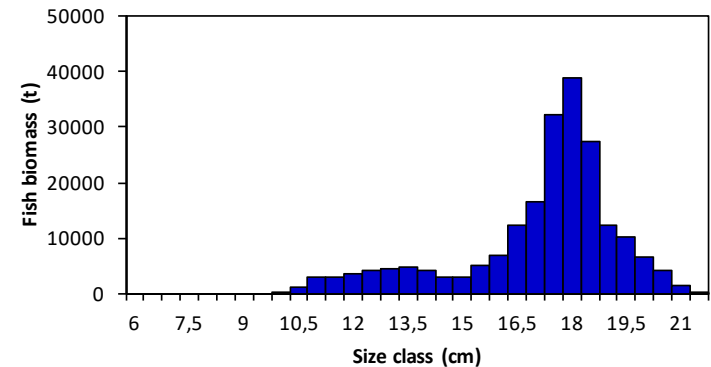
A total of **208 400 t** and **5 451 million** fish were estimated for this species for the whole surveyed area. (PT: 105 783 t; 2 006 million. ES: 102 607 t; 3 445 million).

(ECOCADIZ-RECLUTAS 2019-10: 36 465 t; 937 million).

9a S (TOTAL ABUNDANCE)

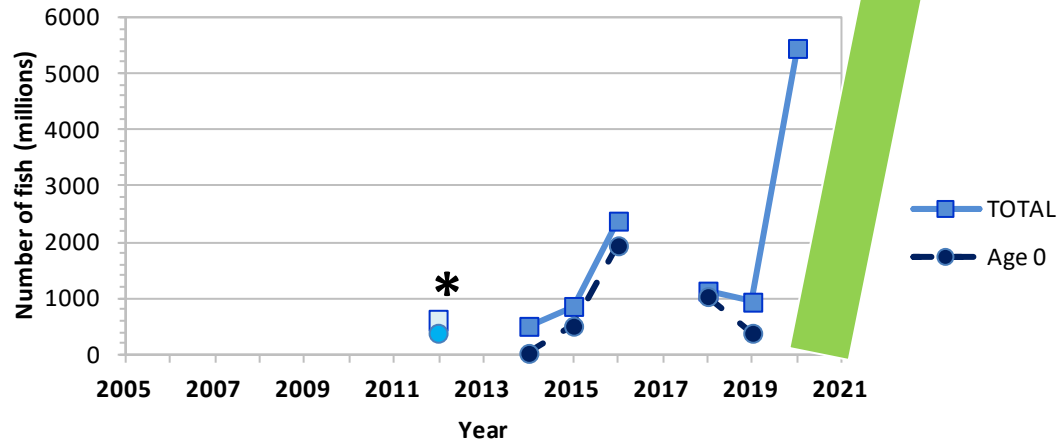


9a S (TOTAL BIOMASS)



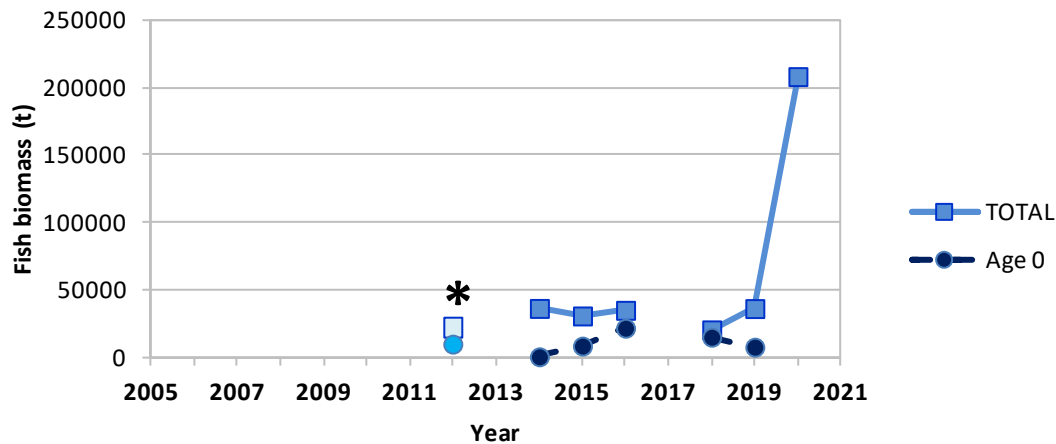
ECOCADIZ-RECLUTAS 2020-10: Sardine. Trends.

Sardine abundance
ECOCADIZ-RECLUTAS Surveys

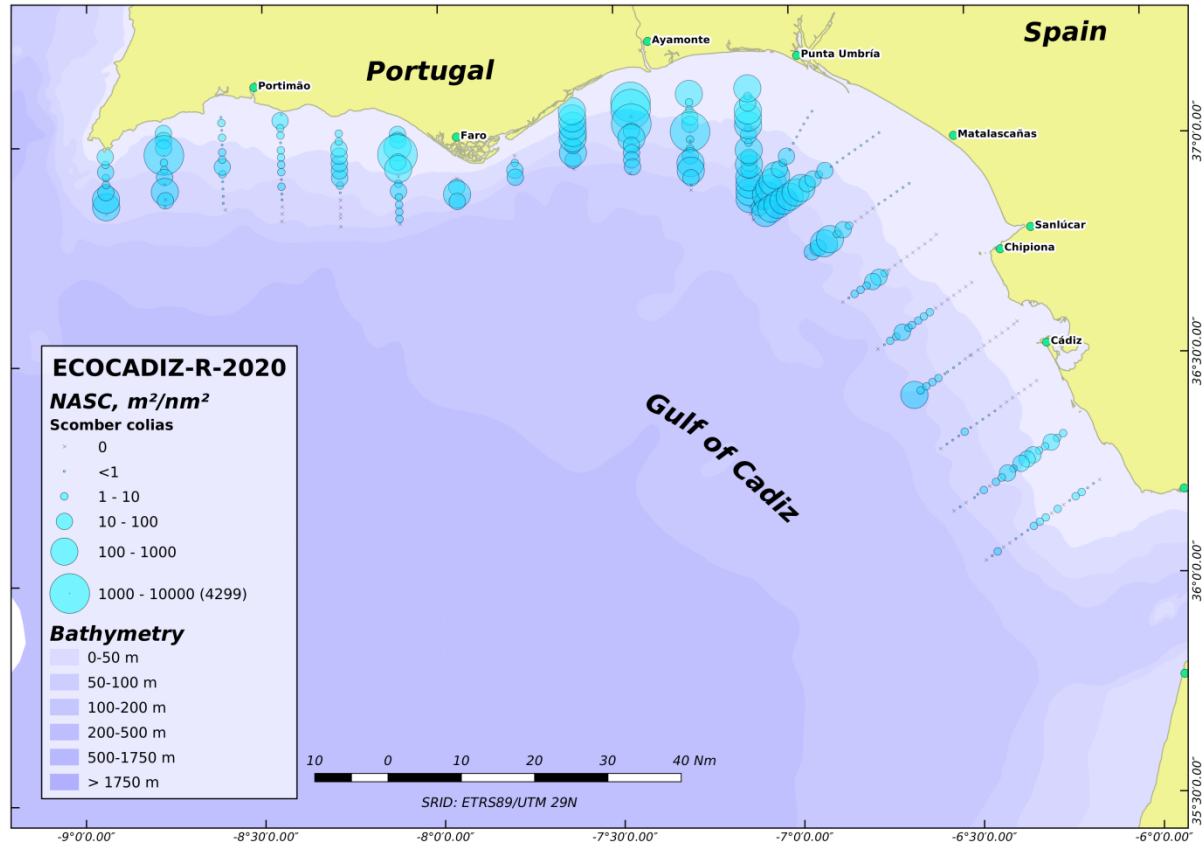


(*) Spanish waters only

Sardine biomass
ECOCADIZ-RECLUTAS Surveys

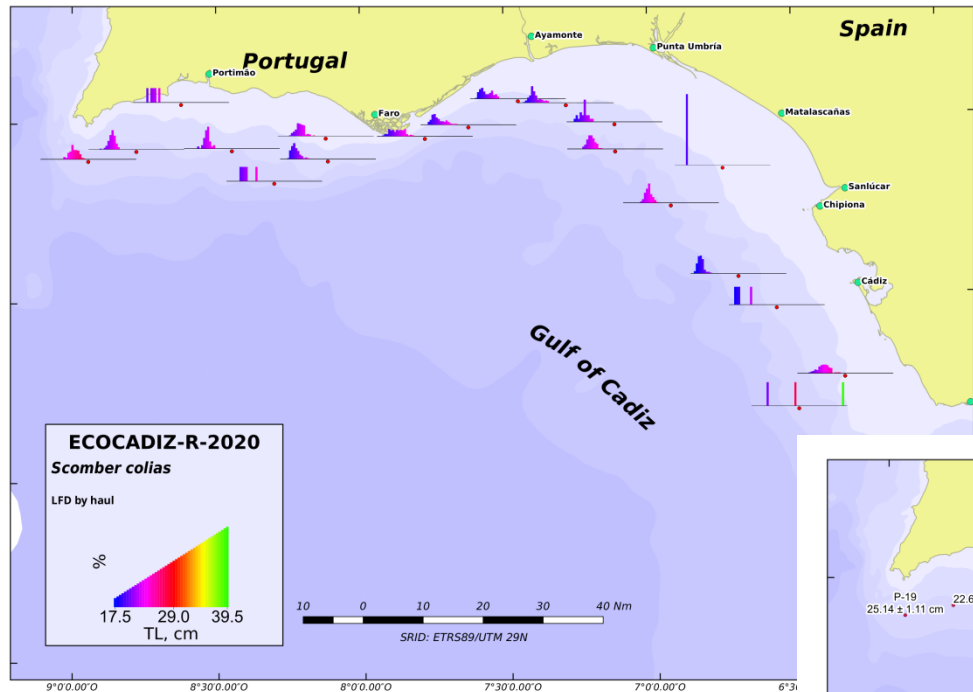


ECOCADIZ-RECLUTAS 2020-10: Chub mackerel. NASC.

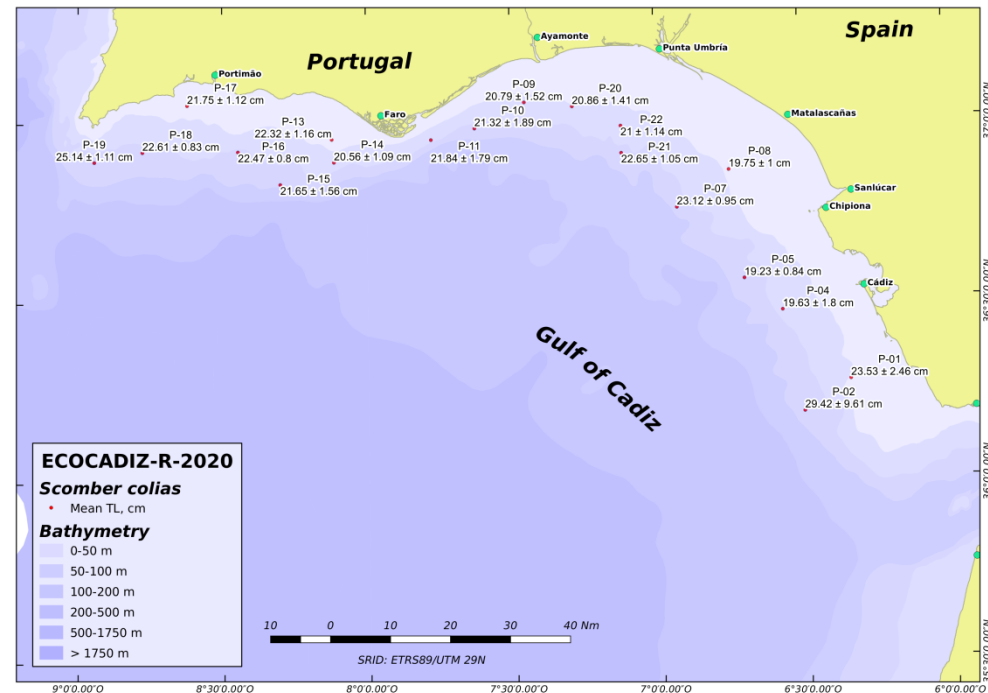


- Widely distributed, but showing higher densities between Cape San Vicente and Mazagón.

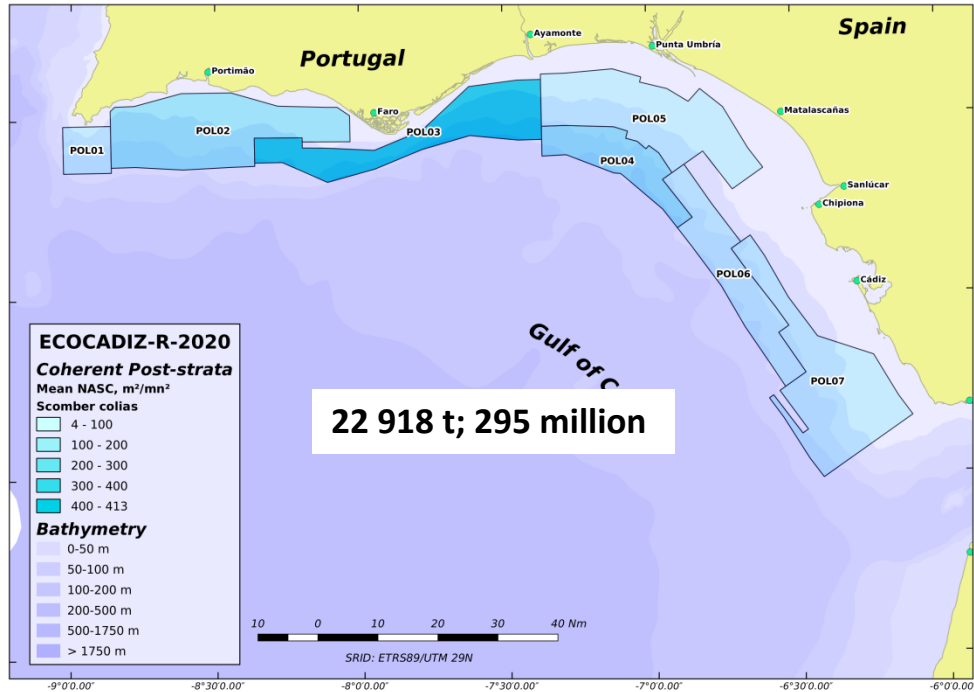
ECOCADIZ-RECLUTAS 2020-10: Chub mackerel. LFD and mean size in fishing hauls.



- No clear spatial pattern in mean size.
- The smallest fish in inner-middle shelf waters between Cadiz Bay and Matalascañas?



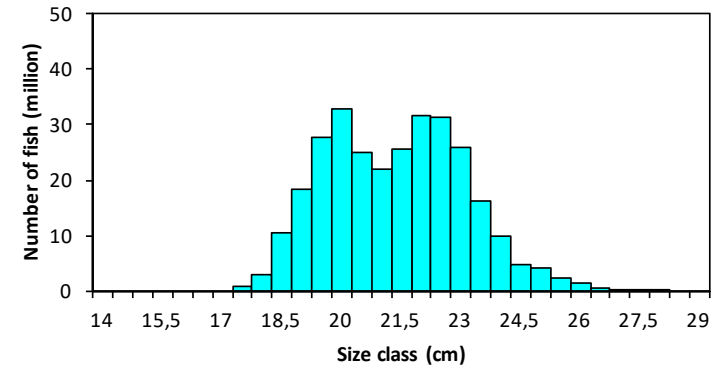
ECOCADIZ-RECLUTAS 2020-10: Chub mackerel. Acoustic estimates.



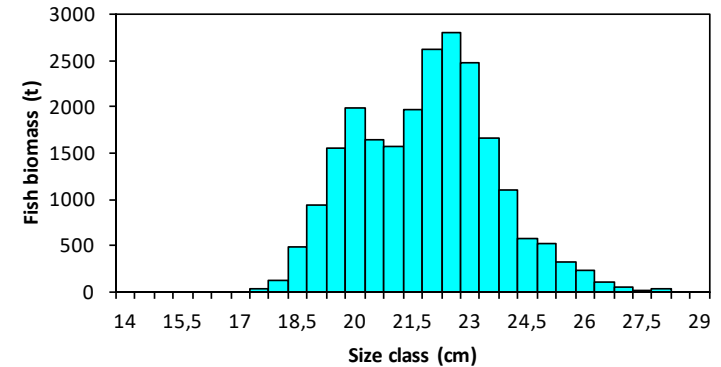
A total of **22 918 t** and **295 million** fish were estimated for this species for the whole surveyed area. (PT: 16 538 t; 216 million. ES: 6 381 t; 79 million).

(ECOCADIZ-RECLUTAS 2019-10: 26 212 t; 367 million).

9a S (TOTAL ABUNDANCE)

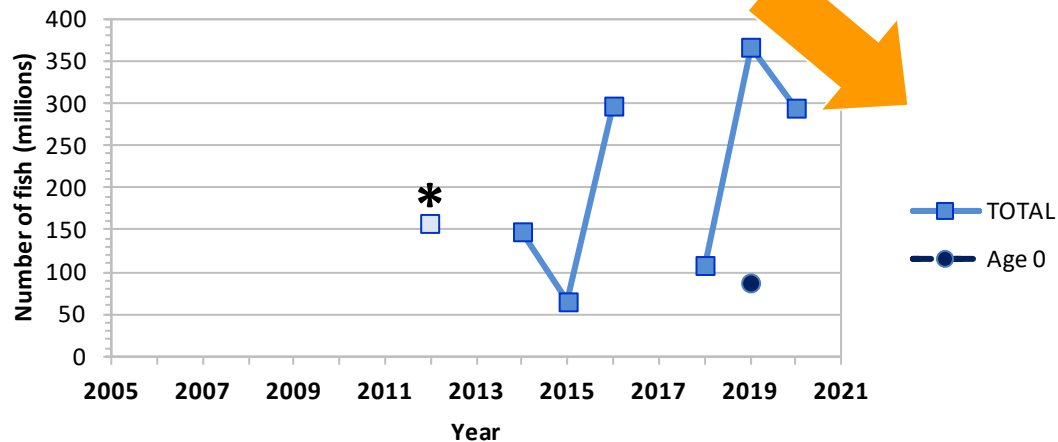


9a S (TOTAL BIOMASS)

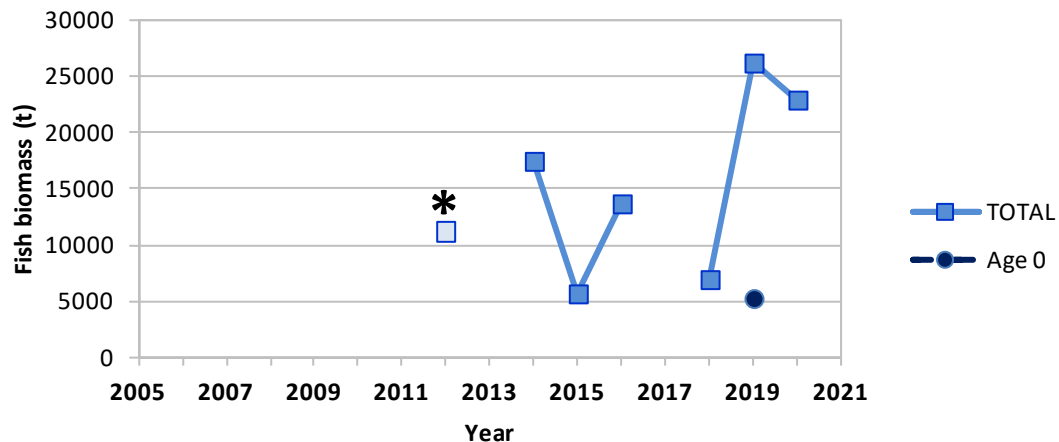


ECOCADIZ-RECLUTAS 2020-10: Chub mackerel. Trends.

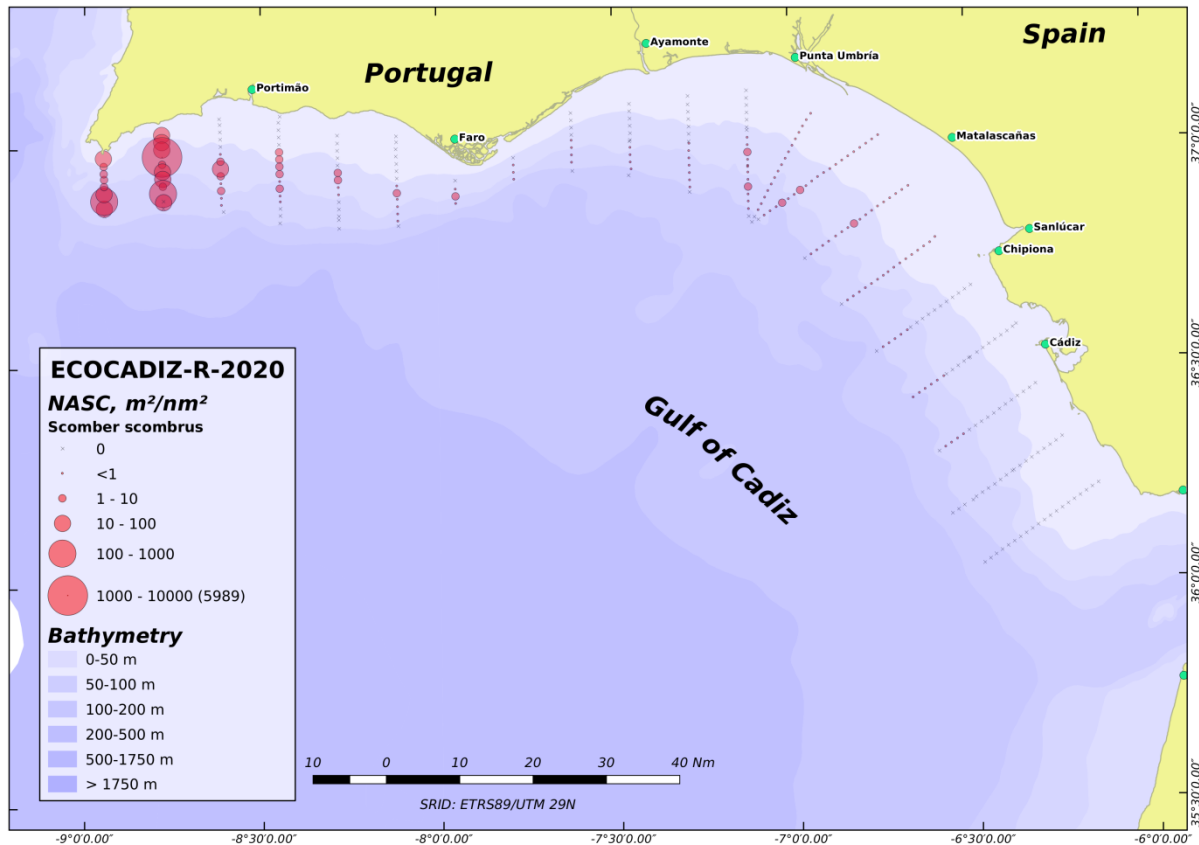
Chub mackerel abundance
ECOCADIZ-RECLUTAS Surveys



Chub mackerel biomass
ECOCADIZ-RECLUTAS Surveys

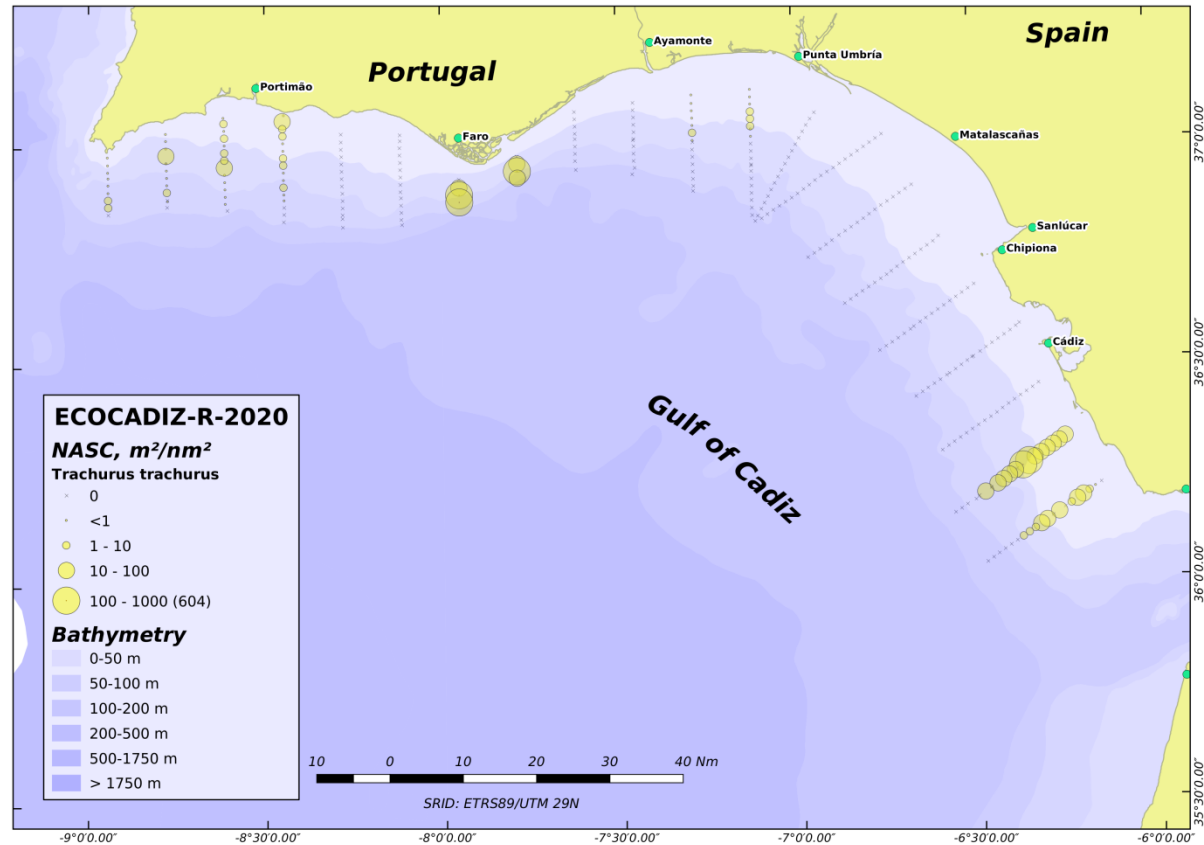


ECOCADIZ-RECLUTAS 2020-10: Mackerel. NASC.



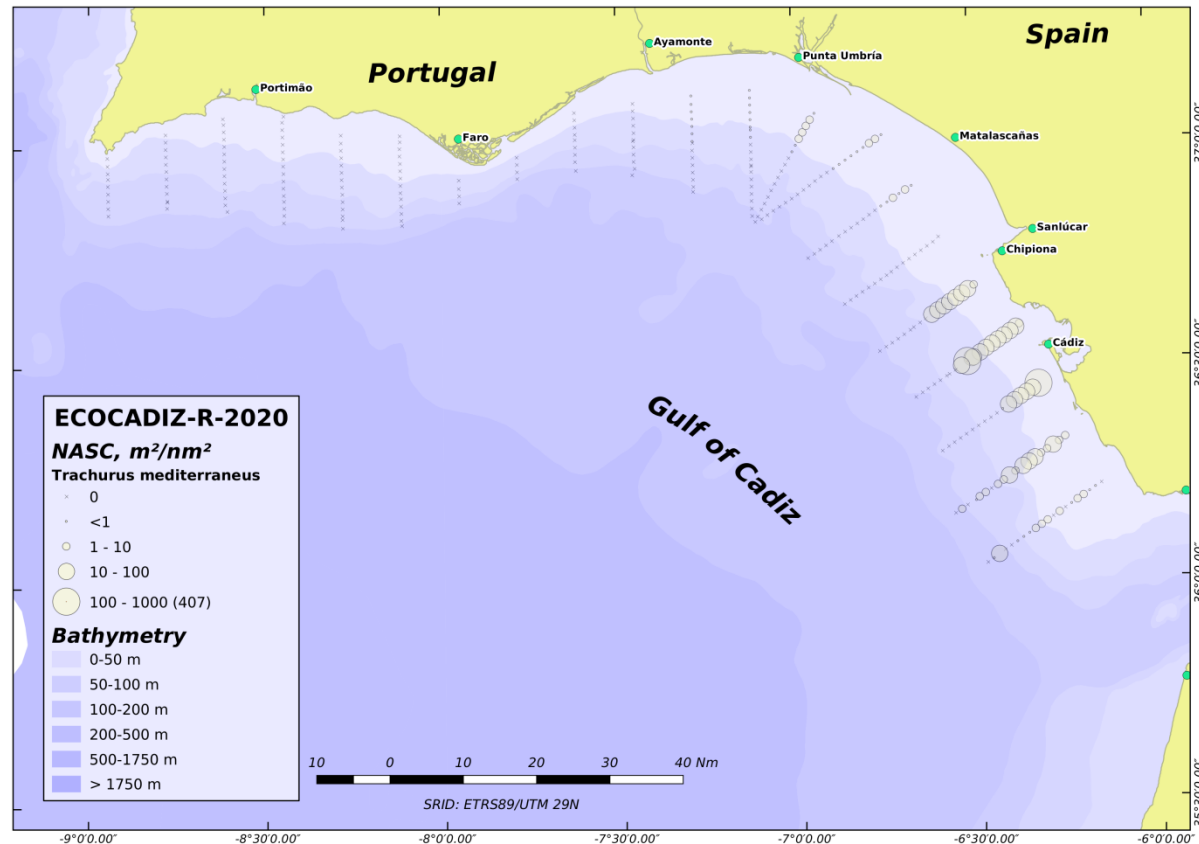
- Main density nucleus in the westernmost Algarve. Incidentally in the central zone of the study area.

ECOCADIZ-RECLUTAS 2020-10 : Horse mackerel. NASC.



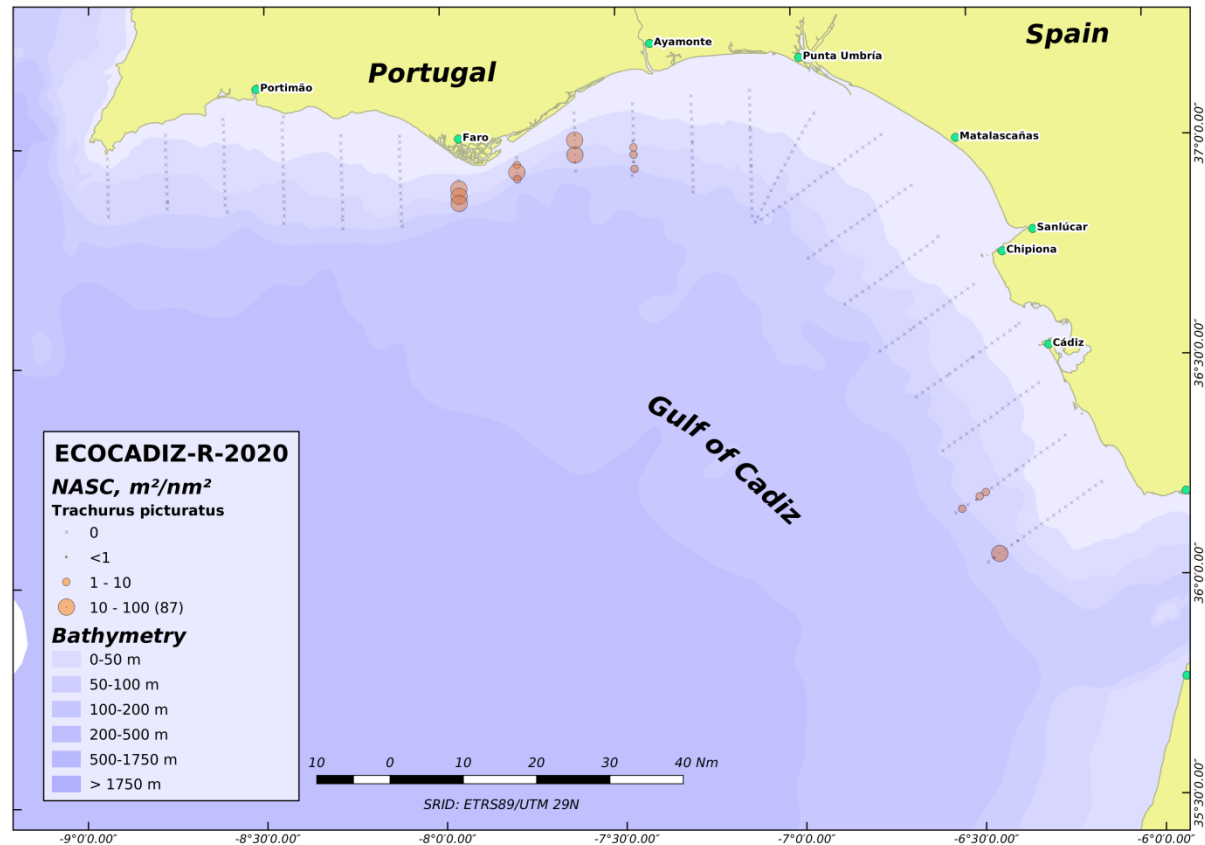
- A very scattered distribution, with main density nuclei in both extremes of the surveyed area and around Cape Sta. M^a.

ECOCADIZ-RECLUTAS 2020-10 : Mediterranean horse mackerel. NASC.



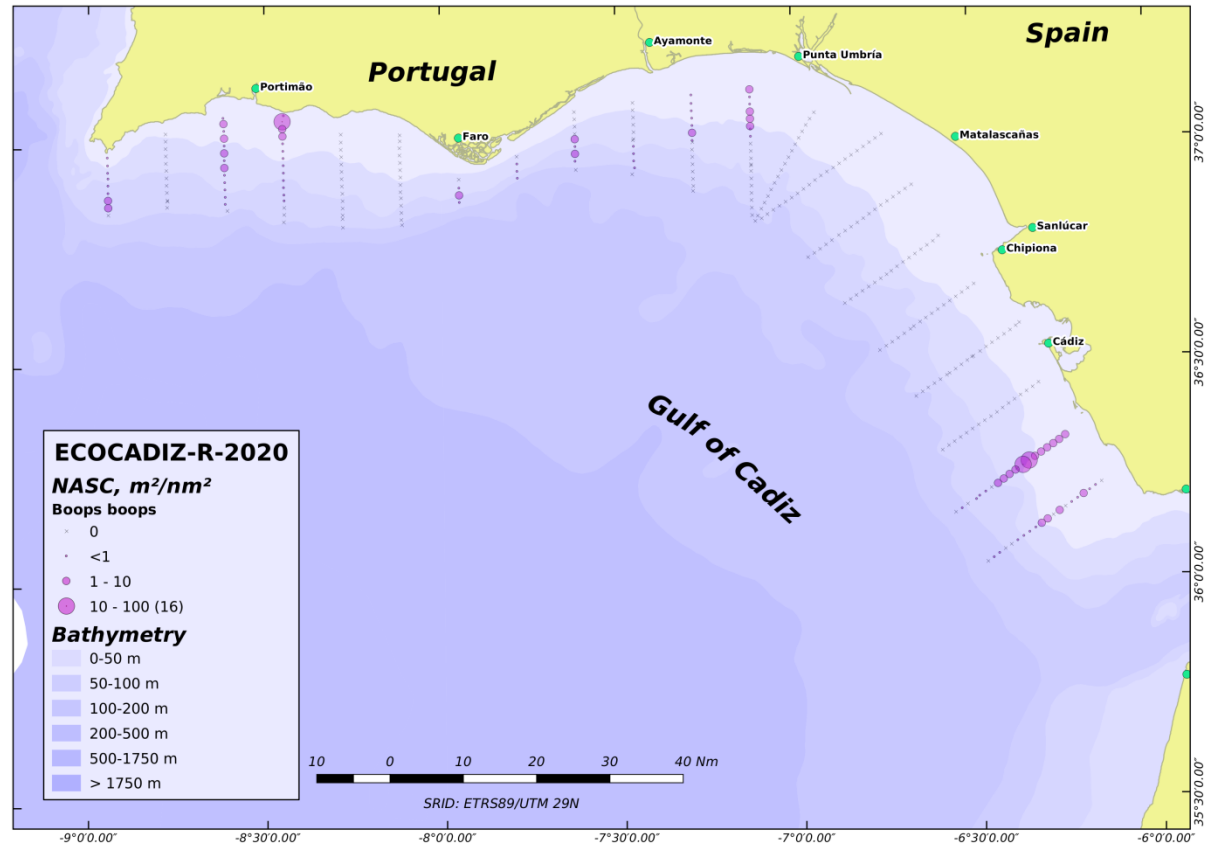
- A typically Spanish species in autumn 2020 (as usual). Distributed as far as the Tinto-Odiel river mouth, mainly over the inner-mid shelf waters.

ECOCADIZ-RECLUTAS 2020-10 : Blue jack mackerel. NASC.



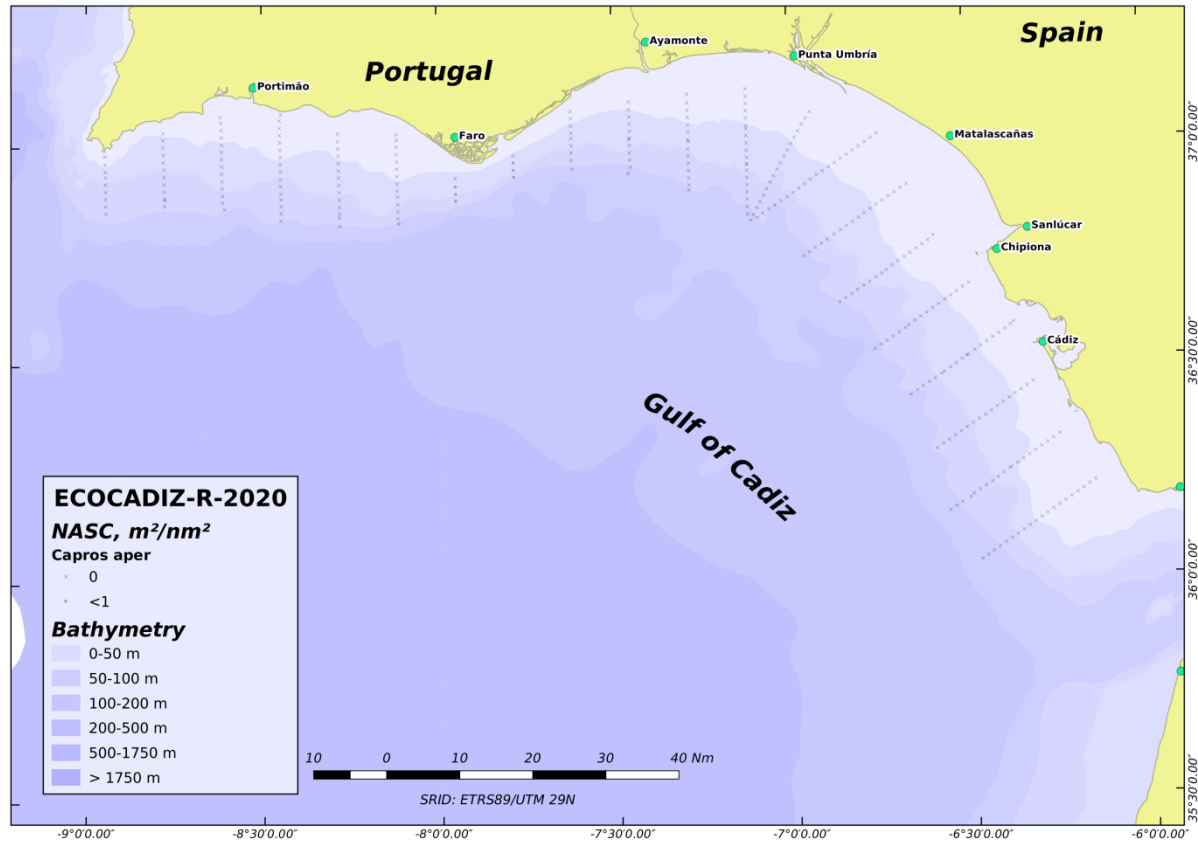
- Very weak detections. Restricted almost exclusively to eastern Algarve shelf waters and incidentally in the easternmost Spanish waters.

ECOCADIZ-RECLUTAS 2020-10 : Bogue. NASC.



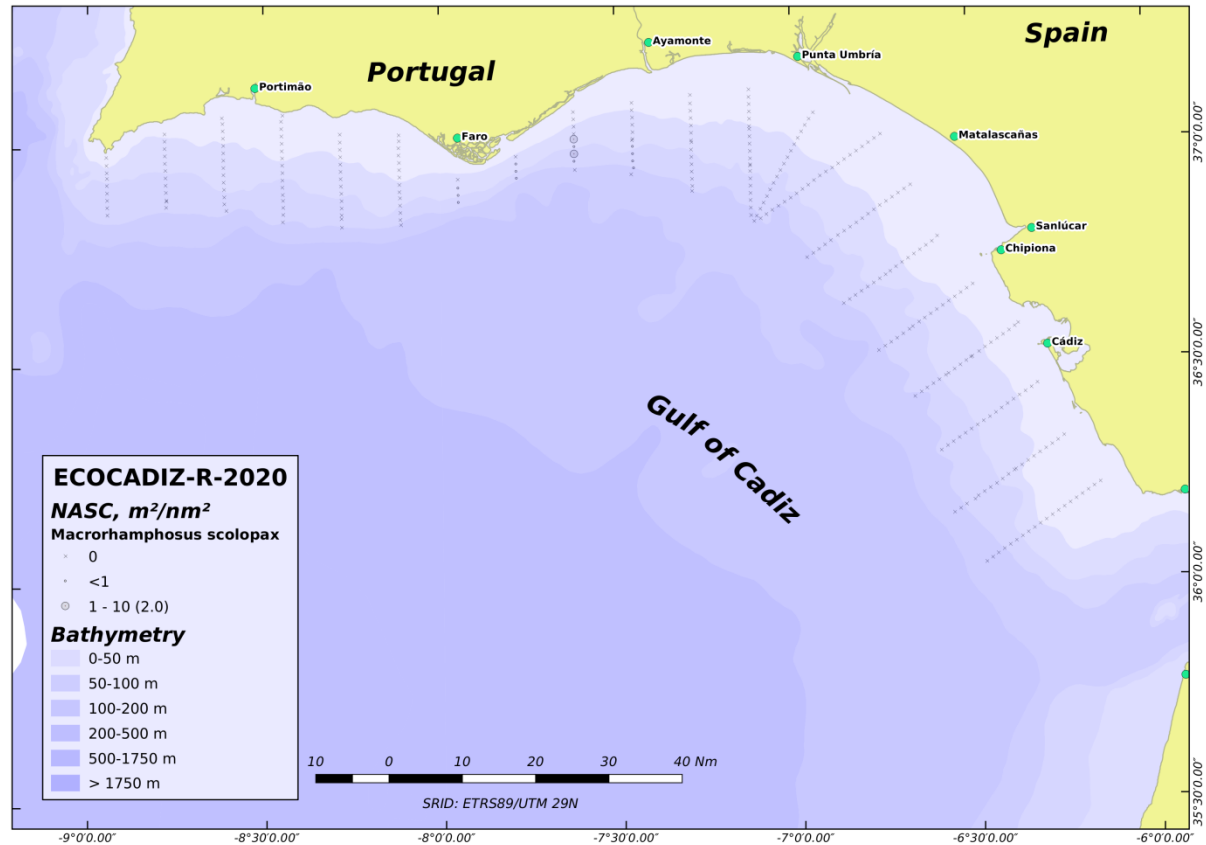
- A scattered distribution showing relatively low detections.

ECOCADIZ-RECLUTAS 2020-10 : Boarfish. NASC.



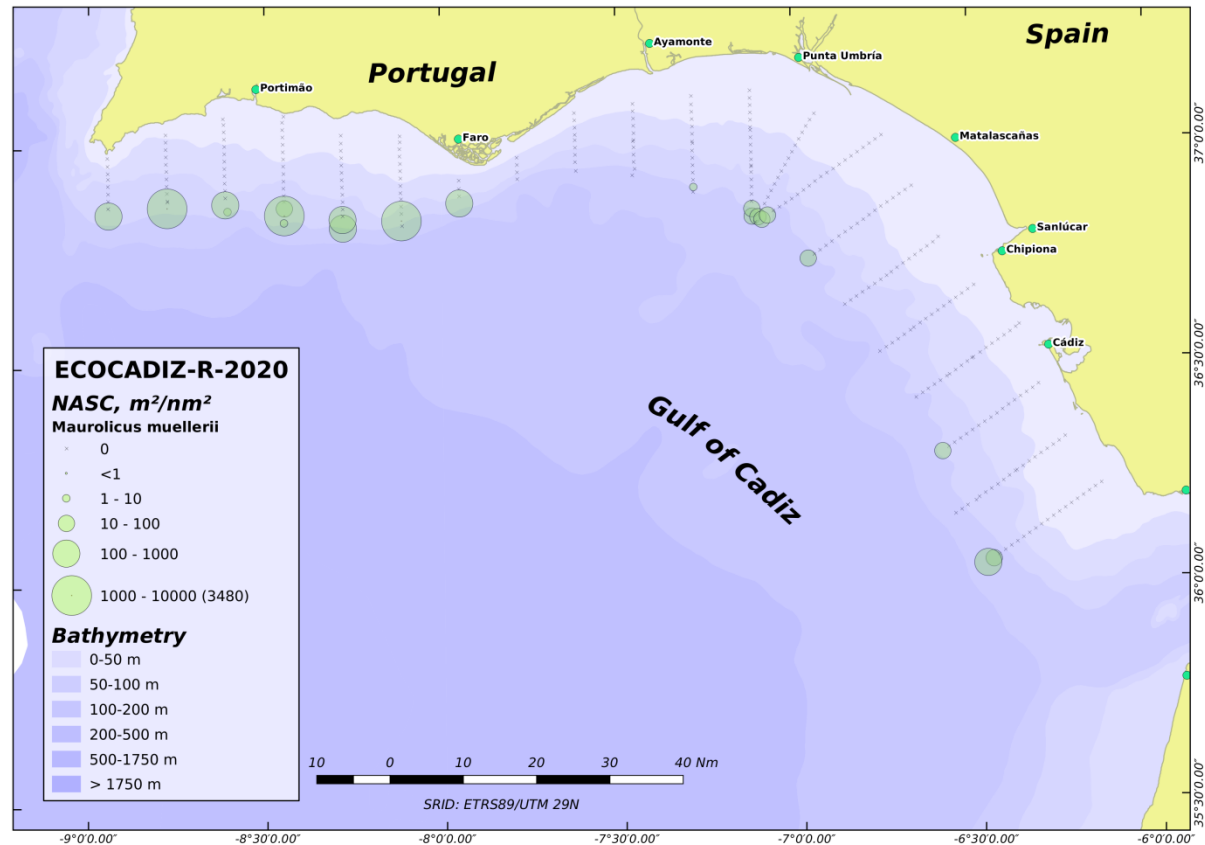
- Restricted to the outer shelf waters around Cape Sta. M^a.

ECOCADIZ-RECLUTAS 2020-10 : Longspine snipefish. NASC.



- Detections relatively low restricted to the eastern Algarve waters.

ECOCADIZ-RECLUTAS 2020-10 : Pearlside. NASC.



- Relatively common over the shelf slope, specially in the western Algarve waters.

Thanks for your attention